Original Article

Depressive Illness in Patients with Eye Disease, A Hidden Entity

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ABSTRACT

Purpose: To determine the frequency of depressive illness in patients presenting with ocular complaints.

Study Design: Observational cross sectional study,

Place and Duration of Study: Watim Medical College, Rawat, Rawalpindi, from October 2021 to November 2021.

Methods: All the patients presenting with ocular diseases and visiting were included in the study. Patients were asked to complete an Urdu translated version of patient health questionnaire (PHQ 9). Inclusion criteria was patients more than 40 years of age, with ocular complaints and either gender. Patients with age less than 40 years, mentally and physically handicapped, having a previous history of psychiatric disease, deaf and mute, any terminal, chronic or debilitating ocular or systemic disease were excluded. The results were analyzed and expressed with descriptive data in frequencies and the numerical data in average and standard deviations. Chi square test of significance was applied taking p value of less than 0.05 as significant.

Results: A total of 537 patients (43.95% males and 56.05% females) were included. 60.71% of the participants were suffering from moderate to severe depression. Among them 12.1% had moderately severe and 16.76% had severe depression. More females (19.55%) suffered from depression which required treatment than males (9.31%).

Conclusion: Significant number of patients presenting with ocular complaints suffered from depression, which can affect or may be effected by the underlying ocular disease. The ophthalmologists should be aware of the entity and should take into account while treating the ocular disease.

Key Words: Eye, Depression, Dry eye disease

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INTRODUCTION

Depression is defined as feeling of unhappiness or being irritable along with body and cognitive alterations lasting for 2 weeks and hindering the capability of a person to function normally.[1] It has become exceedingly frequent so much so that WHO has declared depression as the 4th primary source of health problems and debilities.[1] According to a research, it is estimated that 3.8% of the world population is affected with depression[2] whereas in Pakistan studies have estimated depression as high as 66% in women and 10% in men.[3] Depression often takes a chronic picture and can even occur at a comparatively young age leading to a deep influence on living style and personal health. Furthermore, depression can directly or indirectly affect the onset, course and management of other systemic diseases.[4] Literature reports peak of depression incidences at the age of 44 to 65 years and older.[5] So it can be assumed that the incidence of depression increases after the age of 45 years. Similar to this, the incidences of eye diseases like presbyopia, cataract, glaucoma, dry eyes and age related macular degeneration etc also increase

after the age of 45 years.[6] Therefore it can be hypothesized that depressive illness might be prevalent in patients with ocular diseases and the course of diseases might be affected by it or vice versa.

During the past many years, psychiatric problems like depression have gained importance in health due to its increasing prevalence and its effects as a morbid and a disabling disease.[7,8] The situation might be alarming for a country like Pakistan in which such behavioral diseases are neither acknowledged nor addressed. In order to fill this gap, we conducted a study to determine prevalence of depression in patients with ocular complaints to determine the magnitude of the problem and to set a road map to determine the association of depression with ocular diseases.

METHODS

It was an observational cross sectional questionnaire based study conducted in the outdoor department of ophthalmology after approval from the institutional ethical review board. Convenient consecutive sampling method was used to collect the data. Sample size was calculated online using the website https://www.calculator.net/sample-size-calculator, setting the confidence level at 95% and margin error of 5% and was found to be 385. A written informed consent was obtained from the patients before collecting their data with the assurance that their anonymity will be maintained and the principles of declaration of Helsinki were followed.

All the patients presenting with ocular symptoms/complains and diseases were included in the study. The inclusion criteria was patients with ocular complains above the age of 40 years and either gender. Patients with age less than 40 years, mentally and physically handicapped, previous history of psychiatric disease, deaf and mute, any terminal, chronic or debilitating ocular or systemic disease were excluded from the study. Those refusing consent, illiterate or not accompanied by attendant for helping/ understanding the language were also excluded from the study.

At the initiation of the study, the patients were enquired about their gender and marital status and then were asked to complete an Urdu translated version of patient health questionnaire (PHQ 9).[9] This was later analyzed according to the key provided with PHQ 9. The PHQ-9 is reliable and validated module for detecting and grading depression which can score each of the 9 Diagnostic and Statistical Manual of Mental Disorders. It is a very simple questionnaire in which patient gives answer is yes and no with options of "0" (not at all) to "3" (every day). The scoring of PHQ-9 (Table 1) was done from the key provided with the questionnaire. The scores of 5, 10, 15, and 20 represented mild, moderate, moderately severe, and severe depression, respectively (Table 2).

After completing the questionnaire, the patients under went complete eye examination including visual acuity assessment after refraction, slit lamp examination with intraocular pressure measurement with applanation tonometer and 90D retinal examination. The diagnosis was made accordingly and documented for later analysis.

Table 1: *Patient Health Questionnaire (PHQ-9).*

Over the last 2 weeks, how often have you been bothered by any of the following problems?	Not at All	Several Days	More Than Half The Days	Nearly Every Day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself – or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

Adopted from Kroenke K, Spitzer RL, Williams JB. The PHQ-9: Validity of a brief depression severity measure. J Gen Intern Med. 2001; 16 (9): 606-613.

Table 2: *Guidelines to Interpret PHQ 9 Scores.*

Guide for Interpreting phq-9 Scores		
Score	**Depression Severity**	**Action**
0 – 4	None-minimal	Patient may not need depression treatment.
5 – 9	Mild	Use clinical judgment about treatment, based on patient's duration of symptoms and functional impairment.
10 – 14	Moderate	Use clinical judgment about treatment, based on patient's duration of symptoms and functional impairment.
15 – 19	Moderately severe	Treat using antidepressants, psychotherapy or a combination of treatment.
20 – 27	Severe	Treat using antidepressants with or without psychotherapy.

(Adopted From Kroenke K, Spitzer Rl, Williams Jb. The Phq-9: Validity Of A Brief Depression Severity Measure. J Gen Intern Med. 2001; 16 (9): 606-613.).

The results were analyzed using SPSS version 0.8.3 software while expressing descriptive data in frequencies and the numerical data in average and standard deviations. Chi square test of significance was applied while taking p value of less than 0.05 as significant.

RESULTS

A total of 537 patients participated in the study. There were 43.95% males with mean age of 55 ± 13.32 years and 56.05% females with mean age of 59 ± 15.22 years. Among them, 82.3% participants were married, 8.38% were divorced and 7.82% were widow.

We divided the patients according to the age group I (41 – 50 years), group II (51 to 60 years), group III (61 to 70 years) and group IV (71 and above). It was also found that 22.52% participants who had moderate to severe depression belonged to 61 – 70 years age group.

On evaluating the PHQ 9 questionnaire score according to the key we found that 60.71% of the participants were suffering from moderate to severe depression. Among them 12.1% had moderately severe and 16.76% had severe depression (Table 3). We also found that 19.55% of females suffered from depression requiring treatment (use of antidepressants, psychotherapy or a combination of treatment) whereas this figure was 9.31% in males. When severity of depression was compared to the marital status, it was found that severe depression was present in 12.29% married people, 2.05% in widows and 1.12% in widowers. (Chi square test of significance x2 (1, n = 537) =36.40. = .000) (Table 4)

The most common ocular complaints among the participants were blurred vision in 45.43% and headache in 35.93%.Watery and itchy eyes was complained by 13.59% and complete loss of vision by 3.09% (Table 5).

Table 3: *Gender Wise distribution of Depression.*

Severity of Depression	Gender		Total
	Male	**Female**	**(n = 537)**
None/minimal	20.11%	19.18%	39.29%
Mild	9.87%	9.31%	19.18%
Moderate	4.66%	8.01%	12.67%
Moderately severe	3.91%	8.19%	12.1%
Severe	5.4%	11.36%	16.76%

Chi square test of significance x^2 (1, n = 537) = 16.87 = 0.002

Table 4: *Relationship of Marital Status with Severity of Depression.*

Marital Status	Severity of Depression				
	Non-Minimal	**Mild**	**Moderate**	**Moderately Severe**	**Severe**
Married	34.08%	16.95%	9.87%	9.12%	12.29%
Divorced	3.17%	1.12%	1.12%	1.68%	1.3%
Widow	2.05%	0.56%	1.68%	1.3%	2.05%
Widower	0	0.56%	0	0	1.12%

(n = 537) (Chi square test of significance x^2 (1, n = 537) =36.40. = .000)

Table 5: *Presenting Ocular Complaints of the Participants.*

	Gender		
	Male	**Female**	**Total (n = 537)**
Blurred vision	21.97%	23.46%	45.43%
Headache	17.5%	18.43%	35.93%
Watery/itchy eyes	8.75%	4.84 %	13.59%
Loss of vision	1.86%	2.23%	3.09%
Red eye	0.55%	0.37%	0.92%

DISCUSSION

Depression has become a global burden on the health care system (prevalent in 2.8 – 7.3% of the general

population).[10] It has a relatively chronic course and seemingly can occur in any age group. It influences living style of the individual, the general well being of the patient and affects other systemic diseases but is largely undetected by medical practitioners.

Depressive illness in patients with ocular diseases has been explored by some researchers with different results. They have reported prevalence from 5.4% to 57% in different settings.[11,12] In our study we detected moderate to severe depression in 60.71% of the patients. A similar screening done in Australia on patients attending an eye care service found depression in 37%.[13] Nollett C et al[14] reported significant depressive symptoms in 43% of patients in the United Kingdom. The findings varied among the studies probably because of the difference in depression measuring tools. There are more than 100 depression-measuring tools, most of these being self-administrable. We used PHQ 9 a validated module for detecting and grading depression which can score each of the 9 Diagnostic and Statistical Manual of Mental Disorders. It suits the ophthalmology practice where primary focus is eye examination in a limited time.[15]

We found a gender association in the prevalence of depression (19.55% female vs. 9.31% male). This is similar to already reported literature that females tend to suffer more from depression compared to males.[16] Altaf A et al[17] also found that depressed females were more in number than males. Holloway et al[13] reported the same but Nollett C et al[14] found no conclusive evidence of linking depression and gender.

We found most of the elderly patients suffered from depression in accordance to the findings of Minallah A.[18] Altaf A et al[17] found that higher frequency of depression was found in individual survivors (both widows and widowers) but our findings were on the contrary. We found severe depression in 12.29% married people, 2.05% in widows and 1.12% in widowers whereas Minallah A[18] reported a maximum depression rate (100%) in divorced individuals.

Depression and visual impairment go side by side. Depression can alter vision and can cause visual alterations like seeing floaters, tunnel vision, altered contrast perception, increased light sensitivity and blurred vision. Similarly, in visually impaired individuals depression is common. In our study, the most common ocular complaint was blurred vision in 45.43% and headache in 35.93%. Nollett C et al[14] found a strong association between vision deterioration and depression and concluded that visual deteriorated individuals were 2 – 3 times more prone to develop depression. Similarly, Zheng Y[19] reported that depression was in 25% of patients with glaucoma, 24% of age-related macular degeneration and 23% of cataract patients. In the circuitry of vision, Dopamine plays an important role and deeply affects vision. It is responsible for night vision, contrast sensitivity as well as the visual acuity.[20,21]

Dry eye disease is associated with numerous factors including female gender, increasing biological age, environmental effects, autoimmune diseases, prolonged contact lens usage and medications (both topical and systemic). The symptoms of dry eyes are burning, watering, itching and foreign body sensation in the eyes and many researchers have found an association between the two diseases. We had 13.59% patients with depression complaining of watery and itchy eyes. Zheng Y[19] reported depression in 29% of cases with dry eye disease whereas Al-Dairi W et al[22] reported 42% in his study. In contrast to this Yilmaz et al[23] reported that individuals who suffer from depression are more inclined to develop Dry eye disease. The reason of this strong association might be serotonin. Serotonin receptors are present around the epithelium of the eye which are affected by the pathway of depressive illness or it is vice versa.[24]

This study is not without limitations. Even though the sample size was large enough, it did not take into account certain variables like socioeconomic background, ethnicity and educational level. Furthermore, the data is based upon a particular part of the city and cannot be applied to the whole population. We also did not take into account patients having a concurrent disease with the primary ocular disease but the strength of the study is that we included patients who were not on any psychiatric or other medication and the patients did not have morbid disease beforehand. Therefore, this study will provide a guide map to find further association of eye diseases and depressive illness.

CONCLUSION

We found that a significant number of patients presenting with ocular complaints suffered from depression. The ophthalmologists should be aware of this entity and should take it into account while treating the ocular diseases.

Ethical Approval

The study was approved by the Institutional review board/ Ethical review board (**4/ERB/July/2021).**

Conflict of Interest

Authors declared no conflict of interest.

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Authors' Designation and Contribution

Yasir Iqbal; Professor: *Concepts, Design, Manuscript preparation, Manuscript editing, Manuscript review.*

Aqsa Malik; Assistant Professor: *Literature search, Data analysis, Statistical analysis, Manuscript preparation.*

Waqas Ahmad; Optometrist: *Data acquisition, Data analysis, Manuscript preparation.*

M. Farooq; Associate Professor: *Concepts, Design, Literature search, Statistical analysis, Manuscript editing, Manuscript review.*